GSFC 429-99-05-01

NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS) PREPARATORY PROJECT (NPP)

UNIQUE INSTRUMENT INTERFACE DOCUMENT (UIID) FOR THE CROSS-TRACK INFRARED SOUNDER (CRIS) INSTRUMENT

REVISION A

February 8, 2002

CHECK THE NPP WEBSITE AT http://jointmission.gsfc.nasa.gov TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

INTEGRATED PROGRAM OFFICE
SILVER SPRING, MARYLAND

UNIQUE INSTRUMENT INTERFACE DOCUMENT (UIID) FOR THE CROSS-TRACK INFRARED SOUNDER (CrIS) INSTRUMENT

NPP MISSION

February 8, 2002

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

INTEGRATED PROGRAM OFFICE
SILVER SPRING, MARYLAND

CHECK THE NPP WEBSITE AT http://jointmission.gsfc.nasa.gov TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

Unique Instrument Interface Document (UIID) for the Cross-Track Infrared Sounder (CrIS) Instrument

NPP Mission

Prepared By:

Original signed by

Ralph Welsh, NASA GSFC — Date
Instrument Accommodations Manager, NPP

Reviewed By:

Original signed by

Captain Christina K. Muth, IPO — Date
CrIS Instrument Manager, NPP

Original signed by

Kevin Grady, NASA GSFC — Date
Project Manager, NPP

Original signed by

Peter Wilczynski, IPO — Date
NPP Project Manager, NPOESS

Approved By:

Original signed by

Phillip Sabelhaus, NASA GSFC — Date
Associate Director/EOS Program Manager

Original signed by

John D. Cunningham, IPO — Date
System Program Director, NPOESS IPO

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

INTEGRATED PROGRAM OFFICE
SILVER SPRING, MARYLAND

CHECK THE NPP WEBSITE AT http://jointmission.gsfc.nasa.gov TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

CHANGE RECORD PAGE

DOCUMENT TITLE: Unique Instrument Interface Document (UIID) for the Cross-Track Infrared Sounder (CrIS) Instrument

DOCUMENT DATE: February 8, 2002

ISSUE	DATE	PAGES AFFECTED	DESCRIPTION
Original	02/27/2001	All pages affected	Approved by CCR 429-01-05-001
Revision A	02/07/2002	All pages affected	Approved by CCR 429-01-05-008
CH-01	12/13/2002	Pages iii, iv, v, vi, 3-2 through 3-8, 3-10, 4-1, 6-4, and page 6-5.	Approved by CCR 429-02-05-009R3

EOS 420-CM-05 (4/92)

DOCUMENT TITLE:
Unique Instrument Interface Document (UIID) for the Cross-Track Infrared Sounder (CrIS) Instrument

RELEASE DATE:
February 8, 2002

LIST OF AFFECTED PAGES

Page No.	Revision	Page No.	Revision	Page No.	Revision	Page No.	Revision
Cover Page	Rev. A						
Title Page	Rev. A						
Signature Page	Rev. A						
iii	CH-01						
iv	CH-01						
v	CH-01						
vi	CH-01						
1-1	Rev. A						
2-1	Rev. A						
3-1	Rev. A						
3-2	CH-01						
3-3	CH-01						
3-4	CH-01						
3-5	CH-01						
3-6	CH-01						
3-7	CH-01						
3-8	CH-01						
3-9	Rev. A						
3-10	CH-01						
3-11	Rev. A						
3-12	Rev. A						
3-13	Rev. A						
3-14	Rev. A						
4-1	CH-01						
5-1	Rev. A						
6-1	Rev. A						
6-2	Rev. A						
6-3	Rev. A						
6-4	CH-01						
6-5	CH-01						
6-6	Rev. A						

CH-01

EOS 420-CM-04 (4/92)

CHECK THE NPP WEBSITE AT http://jointmission.gsfc.nasa.gov TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

Table of Contents

Table of Contents (continued)

Illustrations

CH-01

Tables

1.0 SCOPE

The purpose of this Unique Instrument Interface Document (UIID) is to allocate key spacecraft resources and to document certain interface requirements that are unique to the accommodation of the Cross-Track Infrared Sounder (CrIS) instrument on the NPP spacecraft.

The UIID documents the NPP spacecraft resources, such as mass, power, and data rate, specifically allocated to the CrIS instrument in Section 3. Constraints on the integration and test of the instrument and other requirements and procedures are in Section 4. Approved deviations/waivers to interface requirements are in Section 5.

Within the hierarchy of NPP Spacecraft documentation, the UIID has precedence over the General Instrument Interface Document (GIID). This UIID, in conjunction with the GIID, and the NPOESS CrIS UIID establishes the instrument-to-spacecraft interface requirements. This UIID establishes instrument resource requirements for the NPP Spacecraft. Resource requirements are derived from the instrument specification plus the NPP Contingency. In the event of a conflict in instrument resource allocation (without contingency) between the referenced CrIS Performance Specification and this UIID, the NPP Contracting Officer shall be notified, and the order of precedence will be as directed by the contracting officer. The CrIS interface control documents (GIID, NPOESS CrIS UIID, and the NPP CrIS ICD) establish the details of the electrical, mechanical, thermal, integration and test, and command and data handling (C&DH) interfaces between the CrIS instrument and the NPP spacecraft.

2.0 APPLICABLE DOCUMENTS

The following documents specify interface and performance assurance requirements:

a. CrIS System / Subsystem Performance Specification which consists of:

   1. CrIS System Specification, (8179801)
   2. CrIS Sensor Specification, (8179802)
   3. NPOESS UIID for CrIS, ITT 8196181

b. NPOESS Preparatory Project (NPP) / National Polar-Orbiting Operational Environmental Satellite System (NPOESS) General Instrument Interface Document (GIID)

   1. NPOESS FT 1394 Interface Requirements Document
   2. 1553 Interface Requirements Document for NPOESS

3.0 ALLOCATIONS

The NPP spacecraft will accommodate the CrIS Instrument. The resources specifically allocated to the instrument are defined in the following paragraphs. All interfaces are redundant and are designated as A and B respectively.

3.1 COMMAND AND DATA HANDLING ALLOCATIONS

The instrument is allocated the Command and Data Handling (C&DH) resources identified in the following paragraphs.

3.1.1 Science Data

3.1.1.1 Average Science Data Rate Allocation - The instrument is allocated an orbit average science data rate after compression at the interface to the Spacecraft, including all overhead associated with CCSDS packetization by the instrument, of 1.6 Mbps.

3.1.1.1.1 Average Diagnostic Mode Data Rate Allocation - The instrument is allocated an orbit average data rate, after compression, at the interface to the spacecraft of 2.8 Mbps, including all overhead associated with CCSDS packetization by the instrument in the diagnostic mode as defined in paragraph 3.1.3.5 of the GIID.

3.1.1.2 Peak Science Data Rate Allocation - The instrument is allocated a peak data rate after compression at the interface to the Spacecraft, including all overhead associated with CCSDS packetization by the instrument, of 1.8 Mbps.

3.1.1.2.1 Peak Diagnostic Mode Data Rate Allocation - The instrument is allocated a peak data rate, after compression, at the interface to the spacecraft of 3.0 Mbps, including all overhead associated with CCSDS packetization by the instrument in the diagnostic mode as defined in paragraph 3.1.3.5 of the GIID.

3.1.2 Command, Telemetry, and Science Data

3.1.2.1 Interface Buses - The instrument is allocated two (2) redundant Command, Telemetry, and Science Data Interface Buses, Primary (A1, B1) and Redundant (A2-, B2). (TBR)

3.1.3 Science-Data Application Process IDS

The instrument is allocated the science-data APIDs as defined in the 1553 IRD.

3.1.4 Discrete Interface Allocation

The instrument is allocated the following discrete interfaces:

3.1.4.1 Pulse Commands

8, (4 Primary, 4 Redundant)

Note: 4 Primary and 4 Redundant Pulse Commands allocated as spares.

3.1.4.2 Bi-Level Digital Telemetry

8, (4 Primary, 4 Redundant)

Note: 4 Primary and 4 Redundant Bi-level Digital Telemetry points allocated as spares.

3.1.4.3 Passive Analog Telemetry

12, (6 Primary, 6 Redundant)

3.1.4.4 Time of Day Pulse

2, (1 Primary, 1 Redundant)

3.1.4.5 CrIS/ATMS Sync Signal (1 pulse per 8 sec)

2, (1 Primary, 1 Redundant)

3.1.5 Deleted

3.1.6 Instrument Housekeeping Data Rate Allocation

The instrument is allocated a maximum housekeeping data rate at the interface to the Spacecraft, including all overhead associated with CCSDS packetization by the instrument, of 2 Kbps. This is in addition to the science data rates. CH-01

3.1.7 Launch and Early Orbit Data Rate Allocation

The instrument is allocated a maximum Launch and Early Orbit data rate at the interface to the Spacecraft, including all overhead associated with CCSDS packetization by the instrument, of 256 bps. This is in addition to the science data rates. CH-01

3.2 POWER ALLOCATIONS

The average and peak operational power allocations and maximum survival-mode power allocations include contingencies to be managed by the instrument provider. These allocations are the maximum levels allowed. The form for tracking contingencies is included in Appendix A. CH-01

3.2.1 Power/Power Return Feeds

The instrument shall be supplied with four operational power/power return feeds referred to as Instrument Operational Processor Control Electronics (PCE) Power A1 and B1, and Scene Selection Module Power (SSM) A2 and B2.

The instrument shall be supplied with ten survival power/power return feeds referred to as Survival Feeds A1, A2, B1, B2, C1, C2, D1, D2, E1 and E2 .

3.2.2 Peak Operational Power Allocation

The peak operational power allocated to the instrument is 245 watts. The spacecraft shall accommodate a contingency of 37 watts allocated to the instrument. CH-01

3.2.3 Average Operational Power Allocation

Definition: The one-orbit average power is the average power utilized by an instrument over any one-orbit period commencing with the crossing of the night-to-day terminator.

The one-orbit average operational power allocated to the instrument is 123 watts. The Spacecraft shall accommodate contingency of 18 watts allocated to the instrument. CH-01

3.2.4 1394 Power Allocation

The instrument requires 1394 power in addition to the peak and operational power requirements in paragraphs 3.2.2 and 3.2.3. The average power allocated to the 1394 is 12 watts. The Spacecraft shall accommodate an additional 3 watts as contingency. CH-01

3.2.5 Average Outgassing Power Allocation

The one-orbit average outgassing power allocated to the instrument is 123 watts. The spacecraft shall accommodate a contingency of 18 watts allocated to the instrument. CH-01

3.2.6 Reserved CH-01

3.2.7 Reserved

3.2.8 Launch-Mode Power Allocation

The launch-mode power allocated to the instrument is zero (0) watts (TBR).

3.3 MECHANICAL ALLOCATIONS

The instrument shall have the mechanical allocations identified in the following paragraphs.

3.3.1 Mass Properties

The mass allocation includes CrIS Spec Value plus contingency. This allocation plus contingency shall not be exceeded. The form for tracking contingencies is included in Appendix A.

3.3.1.1 Mass Allocation - The total mass allocated to the instrument is 152 kilograms. The spacecraft shall accommodate contingency of 23 kilograms allocated to the instrument. This allocation applies only to components supplied by the instrument provider. CH-01

3.3.1.2 Mass Expendables - The instrument, while on-orbit, will not expel any mass (except for outgassing).

3.3.2 Volume and Fields-of-View Allocations

3.3.2.1 Launch Volume Allocation - The CrIS envelope with isolator and PCE Radiator drawing is shown in Figure 3-1. CH-01

3.3.2.2 Operational Volume Allocation - The CrIS envelope with isolator and PCE Radiator drawing is shown in Figure 3-1. CH-01

3.3.2.3 Radiometric Fields-of-View Allocations - The instrument is allocated the radiometric fields-of-view as shown in Figure 3-2. CH-01

3.3.2.4 Detector-Cooling Field-of-View Allocation - The instrument is allocated the detector-cooling field-of-view as shown in Figure 3-3. CH-01

3.3.2.5 Installation/Removal Volume Allocation

The instrument volume allocated for facilitating installation and removal is shown in Figure 3-1. CH-01

3.3.3 Instrument Mounting

The instrument shall be attached to the NPP spacecraft structure with a six-point mount. The mounts are 5.1 cm in height as shown in Figure 3-1. CH-01

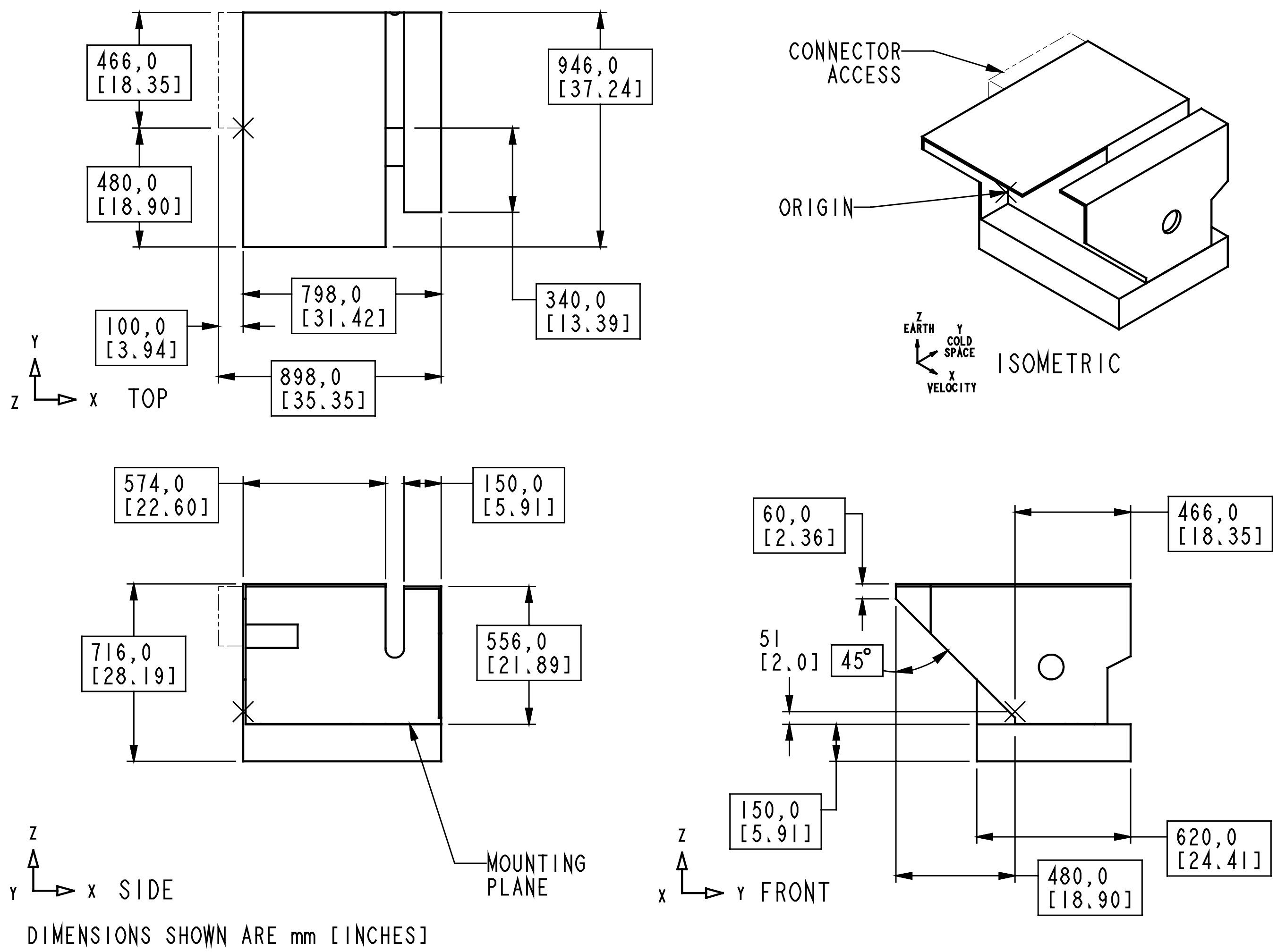


Figure 3-1. CrIS Launch, Operational, and Installation/Removal Volume Allocation

CH-01

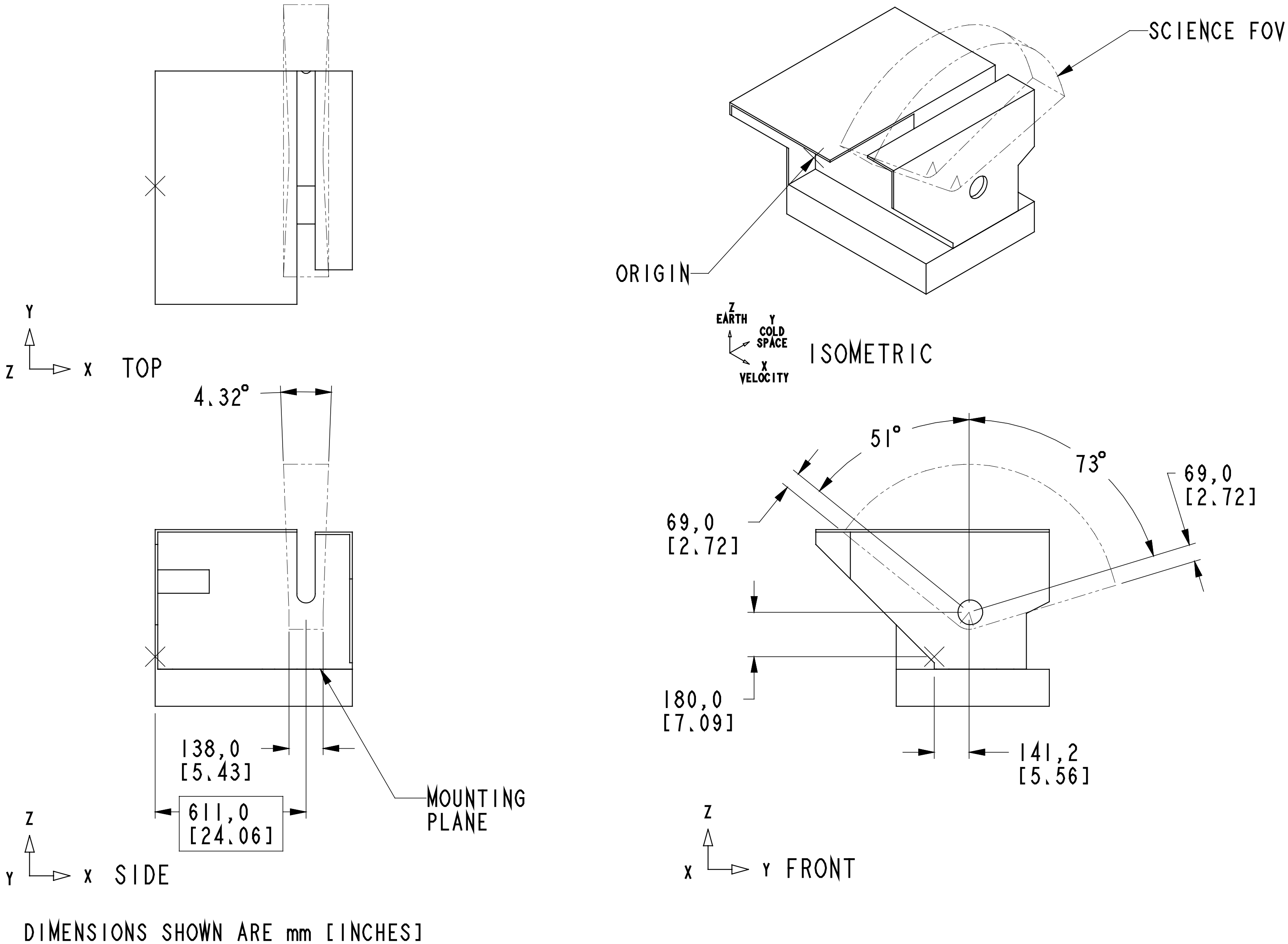


Figure 3-2. CrIS Radiometric Field-of-View Allocation

CH-01

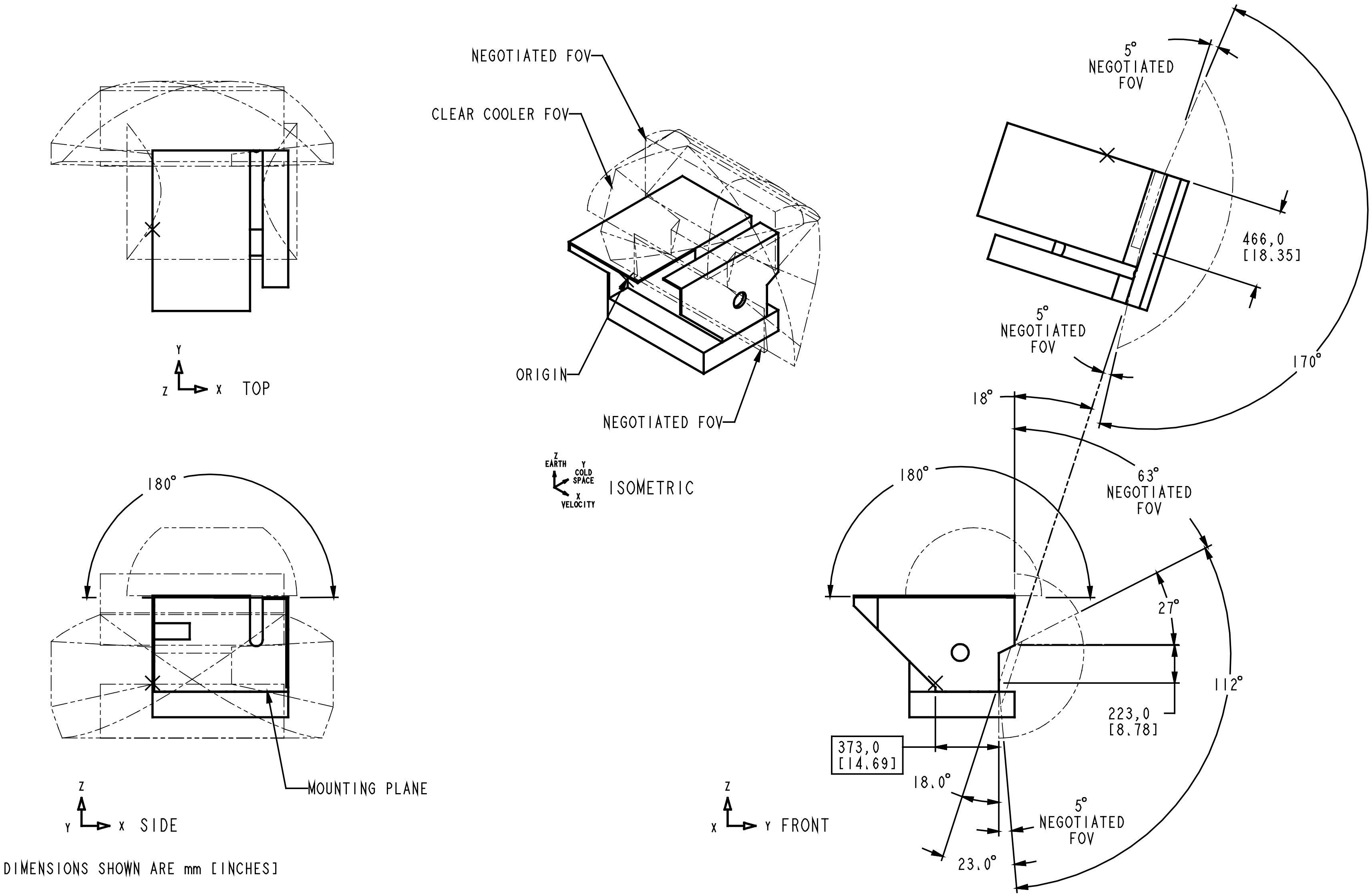


Figure 3-3. CrIS Detector Cooling Field-of-View Allocation

CH-01

3.4 POINTING ALLOCATIONS

Pointing knowledge, control, jitter and rate stability requirements shall be as specified in Table 3-1, Table 3-2, and Table 3-3. Definitions are illustrated in Figure 3-4, and are defined as follows for each spacecraft axis: CH-01

<u>Knowledge</u> - The angle between the actual pointing direction and the estimated pointing direction.

<u>Control</u> - The angle between the actual pointing direction and the desired pointing direction.

<u>Jitter</u> - The peak variation in the actual pointing direction over a relatively short time interval.[1]

<u>Rate Stability</u> - The rotational rate error between the actual rate and the desired rate.

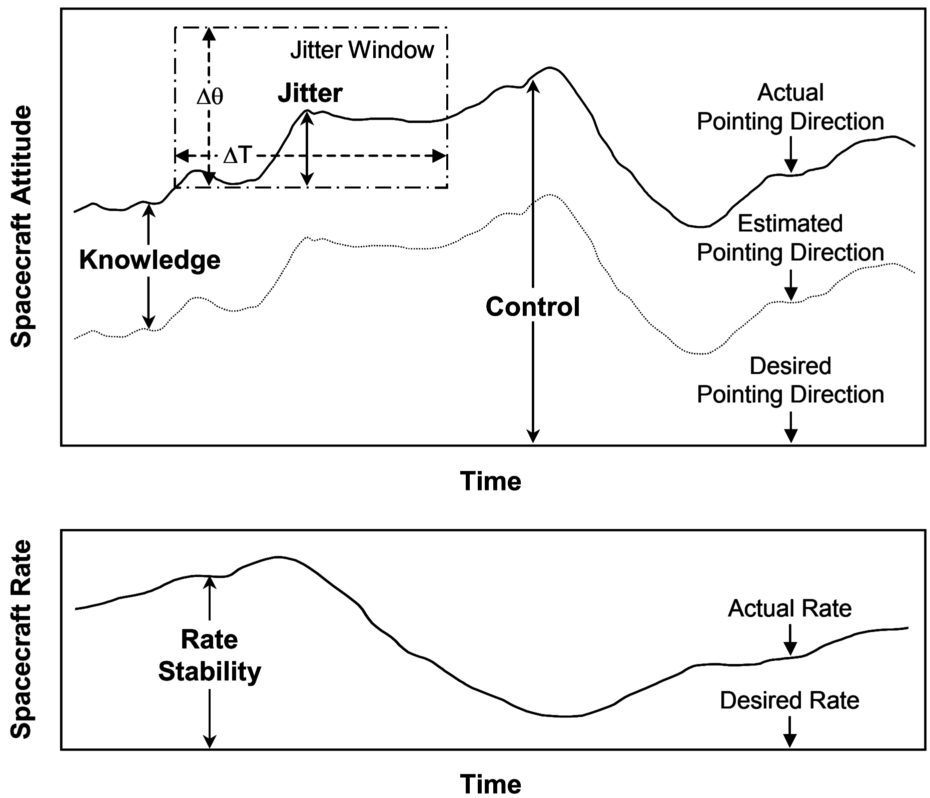


Figure 3-4. Pointing terminology. CH-01

For reference, pointing knowledge and control budgets are provided in Figure 3-5 and Figure 3-6, as a basis for the allocations. CH-01

[1] Short refers to time intervals so short that the controller lacks sufficient bandwith to respond. The duration typically derives from instrument integration or scan times.

Table 3-1
CrIS Mapping Uncertainty, Position and Pointing Requirements and Allocations

Mapping Uncertainty	Knowledge (km) 3σ
Mapping Uncertainty at edge of scan:[1]	4.5 (circular)

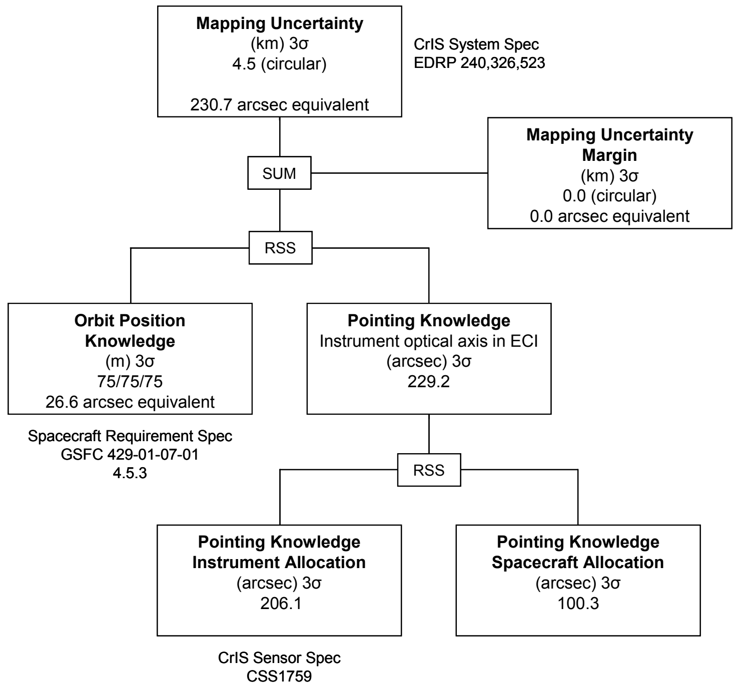
Orbit Position Knowledge Requirement	Knowledge (m) 3σ
Radial, In-Track, Cross-Track:	75

Pointing Requirement and Allocation

Allocations	Control Per Axis (arcsec) 3σ	Knowledge Per Axis (arcsec) 3σ
Pointing Requirement: Instrument boresight points toward the Geodetic target frame of reference[2]	900	231
Unallocated Margin: Arithmetically subtracted from the pointing requirement[3]	0	0
Instrument Allocation: Instrument optical axis to mounting interface	206	206
Spacecraft Allocation: Instrument mounting interface to frame of reference[4]	870	100

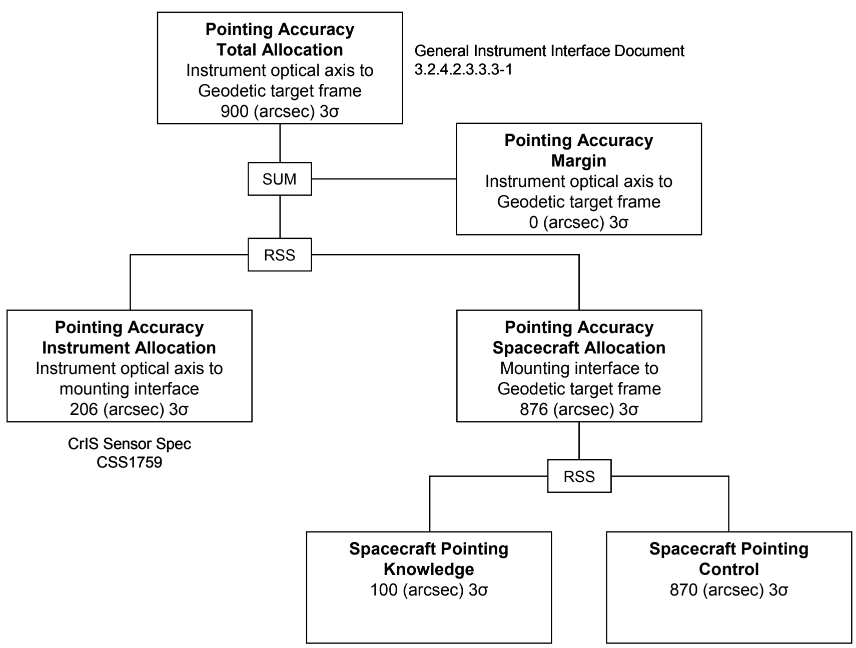
Notes

1. For CrIS mapping uncertainty is defined at the edge of the instrument scan. Surface spatial mapping uncertainty is converted into an equivalent per axis angular value by projecting the surface uncertainty into the plane normal to the instrument LOS at the slant range distance. The resulting angular value is the RSS of the X-axis and Y-axis rotational errors. Orbital position knowledge is the RSS of the in-track and cross-track components converted to an angular error. All spatial to angular conversions assumed an 824 km orbit altitude.
2. The Geodetic target coordinate frame of reference is defined as follows: It is a right-handed, orthogonal frame of reference. The +Z axis is from the spacecraft's center-of-mass and points toward the Geodetic nadir. The +X axis is in the general direction of the instantaneous orbital velocity vector. The +Y axis is in the general direction of the orbit normal, opposite the orbital angular momentum.
3. The unallocated margin is arithmetically summed with the RSS of the instrument and spacecraft allocation to meet the control/knowledge requirement.
4. For control, the frame of reference is the Geodetic target frame. For knowledge the frame of reference is the J2000 ECI frame.
5. ATMS boresight is aligned to the CrIS boresight mounting interface to remove known instrument boresight-to-mounting interface pointing errors. The alignment adjustment range is ±1800 arcsecs, to be provided by the Spacecraft. The spacecraft provider is required to co-align the ATMS and CrIS boresight to an accuracy of 500 arc sec/axis (3 sigma) using instrument supplied boresight to alignment cube data. The pre-launch co-alignment knowledge, between the ATMS and CrIS boresights shall be 30 arc sec/axis, 3 sigma.



Note: Provided for reference only to describe basis of UIID requirements.

Figure 3-5. CrIS pointing knowledge budget. CH-01



Note: Provided for reference only to describe basis of UIID requirements.

Figure 3-6. CrIS pointing control budget. CH-01

Table 3-2
CrIS Jitter Requirements and Allocations

Allocations	Jitter $\frac{\Delta\theta \text{ (arcsec) peak}}{\Delta T \text{ (sec)}}$[3]		
	Roll	Pitch	Yaw
Jitter Requirement: Instrument mounting interface to Geodetic target frame of reference[1]	30.9 arcsec / 0.167 sec	30.9 arcsec / 0.167 sec	30.9 arcsec / 0.167 sec
Unallocated Margin: Arithmetically subtracted from the jitter requirement[2]	0.0 arcsec / 0.167 sec	0.0 arcsec / 0.167 sec	0.0 arcsec / 0.167 sec
Instrument Allocation: Instrument line of sight to instrument mounting interface	21.7 arcsec / 0.167 sec	21.7 arcsec / 0.167 sec	21.7 arcsec / 0.167 sec
Spacecraft Allocation: Instrument mounting interface to Geodetic target frame of reference	22.1 arcsec / 0.167 sec	22.1 arcsec / 0.167 sec	22.1 arcsec / 0.167 sec

Notes

1. The Geodetic target coordinate frame of reference is defined as follows: It is a right-handed, orthogonal frame of reference. The +Z axis is from the spacecraft's center-of-mass and points toward the Geodetic nadir. The +X axis is in the general direction of the instantaneous orbital velocity vector. The +Y axis is in the general direction of the orbit normal, opposite the orbital angular momentum.

2. The unallocated margin is arithmetically summed with the spacecraft allocation to meet the jitter requirement.

3. The CrIS sensor dwells at each earth scene sample location for a period of 0.167 seconds.

Table 3-3
CrIS Rate Stability Requirements and Allocations

Allocations	Rate Stability (deg/sec) 3σ		
	Roll	Pitch	Yaw
Rate Stability Requirement: Instrument mounting interface to Geodetic target frame of reference[1]	0.03	0.03	0.03
Unallocated Margin: Arithmetically subtracted from the rate stability requirement[2]	0.0	0.0	0.0
Spacecraft Allocation: Instrument mounting interface to Geodetic target frame of reference	0.03	0.03	0.03

Notes

1. The Geodetic target coordinate frame of reference is defined as follows: It is a right-handed, orthogonal frame of reference. The +Z axis is from the spacecraft's center-of-mass and points toward the Geodetic nadir. The +X axis is in the general direction of the instantaneous orbital velocity vector. The +Y axis is in the general direction of the orbit normal, opposite the orbital angular momentum.

2. The unallocated margin is arithmetically summed with the spacecraft allocation to meet the rate stability requirement.

4.0 CONSTRAINTS

In order to ensure proper instrument performance or to prevent possible instrument damage, the following constraints are imposed by the CrIS instrument developer on spacecraft integration and test activities, including launch, activation, and operation. CH-01

No constraints have been identified.

5.0 DEVIATIONS/WAIVERS

This section specifically identifies CrIS requirements that deviate from those defined in the GIID, latest revision, or the CrIS System Specification, latest revision. Paragraph titles and numbers, identified in parentheses, are those from the GIID or the CrIS System Specification.

5.1 GENERAL INSTRUMENT INTERFACE DOCUMENT (GIID) DEVIATIONS / WAIVERS

Exceptions to the GIID are noted in the NPOESS CrIS UIID. No deviations or waivers have been identified.

5.2 CrIS SYSTEM SPECIFICATION DEVIATIONS / WAIVERS

No deviations or waivers have been identified.

6.0 APPENDICES

Appendix A CrIS Resource Summary

Appendix B Acronyms

Appendix C Rationale Matrix

Appendix A

Table A-1 CrIS Resource Summary (Form)

RESOURCE SUMMARY

(INSTRUMENT) (DATE)	Weight (Kg)	1-Orbit Avg. Operational Power (w)	2-Orbit Avg. Operational Power (w)	Peak Power (w)	Avg. Data Rate (Kbps)	Peak Data Rate (Kbps)
ALLOCATION CURRENT ESTIMATE PREVIOUS ESTIMATE CHANGE FROM LAST REPORT MARGIN TO ALLOCATION						

WEIGHT

CLASS (PERCENT)	
ESTIMATED	
CALCULATED (layouts and drawings)	
FLIGHT MEASURED	

POWER

CLASS (PERCENT)	1-Orbit Avg.	2-Orbit Avg.	Peak
ESTIMATED			
MEASURED			

POINTING SUMMARY

	Knowledge (arcsec) 3σ			Control (arcsec) 3σ			Jitter (arcsec/sec) 3σ			Rate Stability (deg/sec) 3σ		
	Roll	Pitch	Yaw	Roll	Pitch	Yaw	Roll	Pitch	Yaw	Roll	Pitch	Yaw
ALLOCATION												
CURRENT ESTIMATE												
PREVIOUS ESTIMATE												
CHANGE FROM LAST ESTIMATE												
PERCENT MARGIN[1]												

[1]Defined as (allocation-current estimate)/allocation

Appendix B

Acronyms

APID	Application Process Identification
BDU	Bus Data Unit
bps	bits per second
C&DH	Command and Data Handling
CCR	Configuration Change Request
CCSDS	Consultative Committee for Space Data Systems
CDR	Critical Design Review
CrIS	Cross-Track Infrared Sounder
CSRD	Common Section of the Sensor Requirements Document
FOV	Field-of-View
GIID	General Instrument Interface Document
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
ID	Identification
kg	kilograms
LSB	Least Significant Bit
MAR	Mission Assurance Requirements
Mbps	Megabits per second
mm	millimeter
MSB	Most Significant Bit
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NPP	NPOESS Preparatory Project
NPOESS	National Polar-Orbiting Operational Environmental Satellite System
PDR	Preliminary Design Review
RSS	Root Sum Square
TBD	To Be Determined
TBR	To Be Resolved
TBS	To Be Supplied
UIID	Unique Instrument Interface Document
W	Watt

Appendix C

Table C-1
CrIS UIID Rationale Matrix

UIID Spec. Req.	Title	Rationale	
3.1.1	CrIS Science Data	N/A	
3.1.1.1	Average Science Data Rate Allocation	Derived from the CrIS Sensor Specification plus NPP contingency. Ref. 3.2.19.3	
3.1.1.1.1	Average Diagnostic Mode Data Rate Allocation	Derived from the CrIS Sensor Specification plus NPP contingency. Ref. 3.2.19.3	CH-01
3.1.1.2	Peak Science Data Rate Allocation	Derived from the CrIS Sensor Specification plus NPP contingency. Ref. 3.2.19.3	
3.1.1.2.1	Peak Diagnostic Mode Data Rate Allocation	Derived from the CrIS Sensor Specification plus NPP contingency. Ref. 3.2.19.3	CH-01
3.1.2	Command, Telemetry, and Science Data	Based on CSRD and CrIS PDR design.	
3.1.2.1	Interface Buses	Based on CSRD and CrIS PDR design.	
3.1.3	Science-Data Application Process IDS	Estimated based on similar prior instrument (EOS AIRS).	
3.1.4	Discrete Interface Allocation	Required, based on the CrIS RDR and EDRs based on CSRD and CrIS PDR design.	
3.1.4.1	Pulse Commands	Derived from NPOESS CrIS UIID paragraph 3.8-17.1.	CH-01
3.1.4.2	Bi-Level Digital Telemetry	Derived from GIID paragraph 3.2.4.8.5.2-2.	
3.1.4.3	Passive Analog Telemetry	Derived from GIID paragraph 3.2.4.8.5.2-3.	CH-01
3.1.4.4	Time of Day Pulse	Derived from CrIS Sensor Specification. Ref. 3.2.25.3.	
3.1.4.5	CrIS/ATMS Sync Signal	Derived from CrIS Sensor Specification. Ref. 3.2.25.3.	CH-01
3.1.5	Deleted	Deleted	
3.1.6	Instrument Housekeeping Data Rate Allocation	To provide timing reference to all science data based on CSRD and CrIS PDR design.	
3.1.7	Launch and Early Orbit Data Rate Allocation	Based on 1553 Interface Requirements Document for NPOESS, 9/26/01. Ref. 3.8.2.	CH-01
3.2	POWER ALLOCATIONS	N/A	
3.2.1	Power/Power Return Feeds		
3.2.2	Peak Operational Power Allocation	PRB/CCB No. 02032.	CH-01
3.2.3	Average Operational Power Allocations	PRB/CCB No. 02032.	CH-01
3.2.4	1394 Power Allocation	CrIS NPOESS UIID Version Six dated 8/5/02.	CH-01
3.2.5	Average Outgassing Power Allocation	PRB/CCB No. 02032.	CH-01

Appendix C

Table C-1
CrIS UIID Rationale Matrix

UIID Spec. Req.	Title	Rationale	
3.2.6	Peak Survival-Mode Power Allocation	Derived from NPP I/F TIM held on 6/25/02, section 1, page 19.	CH-01
3.2.7	Reserved	N/A	
3.2.8	Launch-Mode Power Allocation	Based on CrIS PDR design.	
3.3	MECHANICAL ALLOCATIONS	N/A	
3.3.1	Mass Properties	N/A	
3.3.1.1	Mass Allocation	Jitter briefing for PM IPT (11/22/02), page 18.	CH-01
3.3.1.2	Mass Expendables	Based on CrIS PDR design.	
3.3.2	Volume and Fields-of-View Allocations	N/A	
3.3.2.1	Launch Volume Allocation	Based on augmented CrIS Sensor Specification (early 2000) and to provide NPP contingency, and ITT memo dated Oct. 30, 2000, from: R. Kohman, to: T. McCulloch, subject: Clarification of CrIS Cooler Thermal FOV Requirements. Ref. 3.2.20.2	
3.3.2.2	Operational Volume Allocation	Based on augmented CrIS Sensor Specification (early 2000) and to provide NPP contingency, and ITT memo dated Oct. 30, 2000, from: R. Kohman, to: T. McCulloch, subject: Clarification of CrIS Cooler Thermal FOV Requirements. Ref. 3.2.20.2	
3.3.2.3	Radiometric Fields-of-View Allocations	Based on CrIS ICD, and ITT memo dated Oct. 30, 2000, from: R. Kohman, to: T. McCulloch, subject: Clarification of CrIS Cooler Thermal FOV Requirements. Ref. 3.3.1.1.1	
3.3.2.4	Detector-Cooling Field-of-View Allocation	Based on CrIS ICD, and ITT memo dated Oct. 30, 2000, from: R. Kohman, to: T. McCulloch, subject: Clarification of CrIS Cooler Thermal FOV Requirements. Ref. 3.3.1.1.1	
3.3.2.5	Installation/Removal Volume Allocation	Add CrIS installation envelope from NPOESS UIID paragraph 3.6-1.	
3.3.3	Instrument Mounting	Based on CrIS Sensor Specification. Ref. 3.3.1.6	
3.4	POINTING ALLOCATIONS	Based on CrIS ICD, PDR design, and ITT memo dated Oct. 3, 2000, from: Ron Glumb, to: Hal Bloom, subject: CrIS Pointing Requirements Tables, Version 2. Ref. 3.3.1.6.6	
4.0	CONSTRAINTS	N/A	

Appendix C

Table C-1
CrIS UIID Rationale Matrix

UIID Spec. Req.	Title	Rationale
5.0	DEVIATIONS / WAIVERS	N/A
5.1	GIID DEVIATIONS / WAIVERS	N/A
5.2	CrIS SYSTEM SPECIFICATION DEVIATIONS / WAIVERS	N/A